



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/928,029	08/10/2001	Gopal B. Avinash	GEMS:0139/yod 15-NM-5726	5215
7590	06/23/2005		EXAMINER	
Patrick S. Yoder Fletcher, Yoder & Van Someren P.O. Box 692289 Houston, TX 77269-2289			SMITH, RUTH S	
			ART UNIT	PAPER NUMBER
			3737	

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/928,029	<b>Applicant(s)</b> AVINASH ET AL.	
	<b>Examiner</b> Ruth S. Smith	<b>Art Unit</b> 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 April 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 and 92-140 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 and 92-140 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-14,16-27,113-114,117,120-128,130-137 are rejected under 35 U.S.C. 102(b) as being anticipated by Lampotang et al. The claims are directly readable on Lampotang et al which disclose a method of imaging the chest, which can show cardiac activity, whereby a trigger signal is used to trigger the imaging sequence. The trigger signal is a predicted signals based upon a predicted respiration signal. The predicted signal can be obtained by measuring the time between peak respiration signals and then predicting the occurrence in time of the next signal. The sensor used can be non-intrusive and can include a transthoracic belt. Lampotang et al further discloses in column 10, the use of time adjustments to account for imaging system delays.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 15,28-30,115,116,138-140 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lampotang et al. Lampotang et al disclose a method of imaging the chest, which can show cardiac activity, whereby a trigger signal is used to trigger the imaging sequence. The trigger signal is a predicted signals based upon a predicted respiration signal. The predicted signal can be obtained by measuring the time between peak respiration signals and then predicting the occurrence in time of the next signal. A cardiac sensor can also be used to provide a trigger signal in addition to the respiration signal. (See column 9). The sensor used can be non-intrusive and can include a transthoracic belt. Lampotang et al further discloses in column 10, the use of time adjustments to account for imaging system delays. With respect to claim 15, Lampotang et al uses a physiological detector to detect the portion of a cyclical pattern. In the absence of any showing of criticality, the specific type of detector used would have been an obvious design choice of known equivalents in the art. It is well known in the art to filter out signals having undesired frequencies in order to detect the desired physiological signal. With respect to claims 115,116, in the absence of any showing of criticality, whether the sensor is placed on the patient or is remote from the patient would have been an obvious design choice of known functional equivalents in the art. With respect to claims 28-30,138-140, any predictive algorithm used would inherently result in a prediction error. It would have been obvious to one skilled in the art to adjust the times determined based upon the prediction error in order to accurately trigger the event at the desired time.

Claims 1-23,25-30,92-105,107-133,135-140 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watrous in view of Orlando. Watrous discloses a method of triggering an imaging system which includes detecting a physiological activity and

predicting a future occurrence of a particular feature of the measured activity. The predicted future occurrence is then used to trigger the image data acquisition. Watrous discloses that the images should be taken at a point where the heart or other anatomy of interest is in a relatively constant posture. Watrous further discloses that the technique is not limited to the use of EKG signals (see column 1, lines 47-49, column 2, lines 60-63). The use of motion sensors to detect heart motion and/or respiratory motion is old and well known as seen for example in Orlando. In the absence of any showing of criticality, whether the sensor is placed on the patient or is remote from the patient would have been an obvious design choice of known functional equivalents in the art. The sensor of Orlando includes means for filtering out signals of undesired frequencies. Therefore, it would have been obvious to one of ordinary skill in the art to have modified Watrous such that the sensor used is configured to directly sense surface motion of the body to indicate cardiac and/or respiratory motion. Such a modification merely involves the substitution of one well known type of physiological sensor for another. With respect to claims 22,104,132, the neural network inherently performs the analysis as set forth in the claim. With respect to claims 28-30,110-112,138-140, it appears that the ANN inherently performs as set forth, however, it should be noted that in the absence of any showing of criticality, the specific manner in which the prediction occurs would have been an obvious design choice of known equivalents in the art. With respect to claims 26,27,108,109,136,137, it should be noted that Watrous would involve imaging of an anatomy of interest where motion occurs and therefore, the imaging of the event would appear to be inherent.

Claims 24, 106,134 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watrous in view of Orlando as applied to claims 1,92,113 above, and further in view of Lampotang et al. Lampotang et al disclose a method of imaging the chest, which can show cardiac activity, whereby a trigger signal is used to trigger the imaging sequence. The trigger signal is a predicted signals based upon a predicted respiration signal. The predicted signal can be obtained by measuring the time between peak respiration signals and then predicting the occurrence in time of the next signal. A

cardiac sensor can also be used to provide a trigger signal in addition to the respiration signal. (See column 9). The sensor used can be non-intrusive. Lampotang et al further discloses in column 10, the use of time adjustments to account for imaging system delays. It would have been obvious to one skilled in the art to have modified Watrous such that it uses the means disclosed by Lampotang et al to obtain trigger signals which are predicted based upon detected physiological signals. Such a modification involves the substitution of one known means for obtaining predicted signals to be used as a trigger for an imaging system for another.

Claims 92-112, 118, 119, 129 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lampotang et al in view of Orlando. Lampotang et al disclose a method of imaging the chest, which can show cardiac activity, whereby a trigger signal is used to trigger the imaging sequence. The trigger signal is a predicted signals based upon a predicted respiration signal. The predicted signal can be obtained by measuring the time between peak respiration signals and then predicting the occurrence in time of the next signal. A cardiac sensor can also be used to provide a trigger signal in addition to the respiration signal. (See column 9). The sensor used can be non-intrusive and can include a transthoracic belt. Lampotang et al further discloses in column 10, the use of time adjustments to account for imaging system delays. The use of motion sensors to detect heart motion and/or respiratory motion is old and well known as seen for example in Orlando. The sensor of Orlando includes means for filtering out signals of undesired frequencies. Therefore, it would have been obvious to one of ordinary skill in the art to have modified Lampotang et al such that the sensor used is configured to detect physical motion of the body to indicate cardiac and/or respiratory activity. Such a modification merely involves the substitution of one well known type of physiological sensor for another. With respect to claim 104, the neural network inherently performs the analysis as set forth in the claim. With respect to claims 110-112, any predictive algorithm used would inherently result in a prediction error. It would have been obvious to one skilled in the art to adjust the times determined based upon the prediction error in order to accurately trigger the event at the desired time.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-30,92-140 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee and Sepponen each disclose means for sensing physiological activity using motion sensors.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ruth S Smith whose telephone number is (571) 272-4745. The examiner can normally be reached on M-F 7:30 AM- 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Ruth S. Smith', with a stylized, cursive script.

Ruth S Smith  
Primary Examiner  
Art Unit 3737

RSS